DOCUMENT RESUME

ED 086 503 SE 016 968

AUTHOR	Lock, Stan; Hastings, Phil
TITLE	Bailly Homestead Study Guide For Environmental Education.
INSTITUTION	George Williams Coll., Downers Grove, Ill.
PUB DATE	Jun 73
NOTE	84p.; Prepared in cooperation with the Chicago Field Institute, National Park Service
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	Ecology; Environment; *Environmental Education; *Environmental Influences; *Field Studies; Guides; Land Use; *Learning Activities; *Parks; Resource Materials; Sociocultural Patterns

ABSTRACT

This guide is designed to help educators use the potential learning experiences presented at the Indiana Dunes National Lakeshore Park. The first chapter recounts the history of the area from the native Indian era to the present-day , emphasizing the relationship between man, his culture and his environment, The second chapter explores the different types of environments contained in the National Lakeshore area. Chapter three examines the Bailly Homestead area. Selected activities have been designed specifically with the Bailly Homestead Complex in mind; many other activities are included in the guide, but the ones on the Complex form a foundation for the other activities. Chapter four outlines these activities. Some are designed to awaken sensory awareness derived from nature; others involve the subjects in exploring (through disussions) the settlement plans made by the first explorer to the area, Joseph Bailly. Such activities attempt to develop the concept of man as a natural part of his environment interacting with that environment. (JP)

FILMED FROM BEST AVAILABLE COPY

U.S. DEPARTMENT OF HEALTH
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION
THIS DOCUMENT HAS BEEN REPRO-
DUCED EXACTLY AS RECEIVED FROM
THE PERSON OR ORGANIZATION ORIGIN-
ATING IT. POINTS OF VIEW OR OPINIONS
STATED DO NOT NECESSARILY REPRE-
SENT OFFICIAL NATIONAL INSTITUTE OF
EDUCATION POSITION OR POLICY.

ED 066503

BAILEY HOMESTEAD STUDY

SE 016 968

ED 086503

BAILLY HOMESTEAD STUDY GUIDE

for environmental education

by

Stan Lock, Park Ranger
Indiana Dunes National Lakeshore

Phil Hastings, Park Ranger
Capulin Mountain National Monument

George Williams College
Downers Grove, Illinois

June 1973

But, looking back of and beyond the obvious and the tangible for the real source of achievement, we come at last upon the spirit that generates and promotes the act. And thus, after all, what matters most is the spirit that prompts--the urge that drives--the passion that seeks mastery over opposition.

John O. Bowers
Dream Cities of the Calumet
1929

PREFACE

The writing of this guide booklet stems from a cooperative program involving education and government. In 1972 George Williams College, Downers Grove, Illinois, became one of the National Park Service training areas which is referred to as the Chicago Field Institute. The authors wish to acknowledge all of the professionals in both fields for the fulfillment of their own personal and professional objectives.

The Bailly Homestead Study Guide has been written as a tool for enhancing awareness, appreciation, and understanding of the land and its specific resources through environmental education. Man and his culture are components of this land. This booklet is to serve as a foundation for the development of other environmental study areas for Indiana Dunes National Lakeshore (Lakeshore), one of the nation's first urban parks.

This guide book will stimulate the leaders in educational endeavors in utilizing their environment, as well as to respond creatively by designing their own specific programs. Selected activities have been designed specifically with the Bailly Homestead complex in mind; they are not to be considered as the only activities to be used, but become the foundation for other activities to be built upon.

Environmental Education is defined as a way of living not barely, but beautifully so we can all exist in harmony with the environment. The challenge lies in each one of us; it is up to each one of us to take action to have a better world.

Stan Lock
Phil Hastings

George Williams College

TABLE OF CONTENTS

PREFACE iv

LIST OF ILLUSTRATIONS vii

INTRODUCTION 1

OBJECTIVES OF THIS BOOKLET 3

CHAPTER I. THE EVOLVING LANDSCAPE 4

Man and Land Interact

CHAPTER II. POTENTIAL ENVIRONMENTAL STUDY AREAS FOR INDIANA DUNES NATIONAL LAKESHORE 23

CHAPTER III. BAILLY HOMESTEAD ENVIRONMENTAL STUDY AREA 34

Planning Your Trip to Bailly Homestead
The Bailly Trail

CHAPTER IV. ENVIRONMENTAL EDUCATION AND SELECTED EDUCATIONAL ACTIVITIES 42

Environmental Education and the Strands
Selected Educational Activities

CHAPTER V. THE NEXT STEP 72

SELECTED PUBLICATIONS 75

LIST OF ILLUSTRATIONS

1. Quotation by John Bowers iii
2. Land of the Potawatomi -- Trails and Villages, map 14
3. Potential Environmental Study Areas for Indiana Dunes National Lakeshore 33
4. Bailly Trail, map 41
5. Town of Bailly, 1833, map 54
6. Genealogical table of the Bailly family 56
7. Sketch Plan, first floor, Bailly House 58
8. Sketch Plan, second floor, Bailly House 59
9. Poetry at the Bailly Homestead 66
10. Quotation by Freeman Tilden 72

INTRODUCTION

Indiana Dunes National Lakeshore was authorized by Congress in 1966 as one of the first urban parks in the midwest. The area is within reach of over ten million people of every ethnic and cultural background.

An urban population such as this needs a source of recreation which will allow them to feel the earth rather than concrete, to feel sun and rain on their faces, and to associate with nature for a refreshing of the physical and mental capacities of the individual.

The Lakeshore area is as diverse as the population. The geological history of continental glaciation is second to none. Examples of ecological succession of plants and sand dunes are extraordinary from the scientific and esthetic points of view. Man's history in this area is interwoven with the land and represents an outstanding example of the settlement and development of the early midwest.

This guidebook is designed to include a look into the potential learning experiences available in an area where man and nature have interacted for several hundred years.

The Bailly Homestead Environmental Study Area is but a first step in enjoying the diversity of Indiana Dunes National Lakeshore. The information and activities in this guidebook are directed toward a study of the process of experiencing an environmental awareness on both an individual and group basis. Share the experiences and insights gained.

Come to know this part of Indiana as a personal friend. Use your imagination and the results will be a rewarding and lasting experience.

OBJECTIVES OF THIS BOOKLET

The objectives of the Bailly Homestead Study Guide is to assist the environmental study area participant to:

1. Become aware of the environmental education program at Indiana Dunes National Lakeshore.

2. Learn the environmental concepts (the Strands) which can be used as an approach to bring about a growing awareness of the total environment and thereby lead to a personal environmental ethic.

3. Experience the Bailly Homestead area as an environmental teaching resource for present school curriculums or educational enrichment.

4. Experiment with selected activities that may lead to an increased awareness of man's relationship to the total environment.

5. Become more familiar with educational literature that pertains to the Lakeshore, or to literature that can be adapted to the same environment.

CHAPTER I

THE EVOLVING LANDSCAPE

Standing on the foredunes of Beverly Shores a person may marvel at the fact that such a huge water area, Lake Michigan, exists. Almost immediately he ponders the questions: is it drinkable, can he swim in it, how long will he be able to eat fish from it, and so on. Is Lake Michigan polluted? How much pollution has to occur before the answer is in the affirmative? A person sees the effects from storms and high water, he sees dunes collapse and slide into the Lake, he sees trees that are uprooted, he sees blowouts and so on. A dune is a dune is a dune; it is a temporary product of nature that is created and destroyed by environmental forces.

Man sees too where the roads were; and he sees the undercutting of houses, homes slipping into the water, power lines threatened, and people forced out of their homes. How confused people are when nature goes against their wishes. How long can man live in an era that believes man dominates nature and has forgotten that man is a part of nature?

On a clear day a person may see the skyline of Chicago, other cities, and the industrial complex that appears continuous with the topography of the land. He projects feelings when tall buildings and

other known landmarks are recognized. Nature is impressive, so is what man has created.

Both the man-made environment and the natural environment are undergoing change. Neither has been as it is now for very long. Both are interacting with the sun, soil, air, water, and populations. Both are dependent upon all or some of these components for survival. These components are interrelated in the development of the Great Lakes region as well as the development of the man-created structures that came centuries later.

In pre-glacial days, the lands of the Great Lakes region probably drained into the St. Lawrence watersheds. The time was approximately two million years ago. As winter snows increased, leaving large deposits of snow, ice began to form. Some glacial geologists speculate the ice was nearly two miles in thickness. Glaciers during the Great Ice Age moved through the Lake Michigan region four or five times carrying debris from the northern part of the North American continent.

Debris formed natural dams to hold the waters from the melting glaciers. Each major glacier left Lake Michigan at a different level. From approximately sixteen thousand years ago to the present, the Lake level fluctuated at least three major times; levels changed from 640 feet to 579 feet above sea level, dropping approximately twenty feet each time. The names which note the various eras of this period are Lake Chicago, Lake Algonquin, Lake Chippewa, and finally Lake Michigan.[1]

---

[1] R. W. Kelley and W. R. Farrand, "The Glacial Lakes around Lake Michigan," Geological Survey, (Bulletin 4, 1967), p. 3-17.

Topography of the land and of the Lake changed throughout time. Geologists are not in agreement regarding the bottom terrain of the Lake. More recent studies indicate that the glaciers did not scour out the bottom but did scar the ridges between the basins. The bottom is not a smooth basin, but has 200-foot vertical cliffs in the northern section. The northern section of Lake Michigan is separated from the southern section by rock and rock debris formations of 200 feet in height; this is referred to as the mid lake high. These studies further indicate measured depths of 923 feet in the northern basin and 534 feet in the southern basin; the mid lake high in between is covered with some 300 feet of water.[2]

Lake Michigan influences the climate and surrounding land mass a great deal. It is not just an idle lake occupying space and providing water to various drainage systems. The mid lake high contributes to the currents and thermal conditions of the south basin of the lake. The cold ground waters initiate currents independently of the effects of the wind; mid level currents as well as surface currents also exist. During the winter warm air flows from the land and cools over the cold water, creating a cushion that keeps the waters fairly calm; rays from the spring and summer sun are absorbed and stored in the lake. In the fall, cold air comes down from the Arctic and Canada and interacts with the

---

[2]Comments of Edith McKee, member of American Institute of Professional Geologists, in regard to the "Ecological Workshop on Natural Resources of Indiana Dunes National Lakeshore," April 1971, p. 22-28. Unpublished, typewritten document located in the NPS library at the Lakeshore visitor center.

warm water which may cause extreme turbidity and extreme storms. Seasonal overturn occurs in the Lake and heat from the Lake goes into the atmosphere. Some meterologists claim that on some brisk fall days the energy exchange from Lake Michigan into the atomsphere equals the energy from approximately sixteen atomic bombs.[3]

Lake Michigan is a powerful force of its own. However, it is not totally independent. It interacts and is dependent upon the sun, soil, air, and other waters for its survival. Climatic conditions of the immediate area are influenced by its interactions with the Lake. The relationship is extended to influence the types of plants and animals that flourish within the same surroundings. Lake Michigan acts also as a barrier for plants and animals in going between east and west, or between north and south. The same species of living organisms are not necessarily endemic to all the surroundings of the Lake.

The lands remained rich in timber, sand, and in fur-bearing animals for many decades. This barrier became a hub of plant life radiating out from three major biomes: species from the grasslands, the northern coniferous forests, and from the eastern deciduous forests. The convergence of these three zones is significant to the dunes complex.

Some 12,000 years ago the Bailly Homestead area, the major topic of this booklet, embraced dunes, beaches, and bars as shoreline features of Lake Michigan. The new dunes were bare and without soil for plant life. The foredunes were subject to the erosional effects of the wind

---

[3] Ibid., p. 29-30.

and also held the heat from the sun's rays. Foredunes act as barriers against wind erosion in protecting older dunes to the south. Foredunes are invaded by beach grasses, referred to as sand binders, and cottonwood seedlings.

As water levels change, more foredunes are created. As life cycles continue, soil accumulates and the foredune, now further inland, becomes a pine dune dominated by white pine, jack pine, juniper, and various shrubs. With added protection from climatic factors along with increased age and fertility of the pine dune, hardwoods invade the coniferous forests, establishing their own seedlings of black oak, white oak, basswood, and elm. Each major successional change brings in more shrubby plants and animals.

Again the same dune, which was once a foredune, evolves and becomes a beech-maple dune. Some of the largest maples and birch trees of Porter County exist in the Bailly Homestead complex. These climax tree species produce dense shades that kill off oak and pine seedlings. Undergrowth is also thick with ferns, herbs, and mosses. This evolutionary and adaptive process may take approximately ten thousand years to materialize.[4]

The soil in the Bailly Homestead area comprises clays, silts, and sands. In soils that contain much sand, many nutrients are filtered down through the porous granules beyond reach of the roots from the ground

---

[4]W. J. Beecher, "The Indiana Dunes," (Science Notes, the Chicago Academy of Sciences), Chicago, Illinois.

plants. Many beech-maple forests reach their climax stage only to regress to mixed stands with species from the oak dune stages.

The scene before man has changed in relation to the environmental forces of storms, glaciers, and wind; succession of the various forms of flora have held the soil in place and provided a habitat for the animal life that existed. Changes were natural processes and were not technological; cycles maintained a continuity of life.

The dunes, vegetation, animal life, and the Lake were slowly evolved. Each component plays its own individual role in the regional scene, each one interacting with other life or land forms or with climatic conditions. Not any single component is capable of existing independently.

Man and Land Interact

For the moment, erase from your mind the Calumet region as you know it. Imagine you are a Pottawatomie Indian. Capture the mood and relive the past. Think of the miles you've walked along virgin forests and sandy beaches. Remember the early morning and late afternoon hours you spent picking wintergreen berries or sand hill cherries. Think of the wading around in wet marshland in search of wild rice. And, too, recall how good it tasted, along with squirrel or buffalo, cooked over flames that warmed body and soul as icy winds pushed at the log hut.

In another time and place, how different were the thoughts of people? Were they only of survival, or were there times of quiet thinking and planning for tomorrow? Were there moments for laughter, for

crying, time for love and affection? Were there times for people to interact with people in all of the natural ways in which we still find ourselves engaged? People are the tie, the continuity of living history. The dreams, the struggles, the simple and complex interaction with those like themselves and those different and with the land and time are written in the sands and soil of the Indiana Dunes National Lakeshore. The facts which have influenced the past and even today influence the daily lives of millions of people in the Calumet region are important sources for understanding. They help capture the mood of man's past and how he has associated with the land.

What is needed to understand this interaction, however, is more than facts. We need to imaginatively and emotionally relate to the lives and feelings of the people of the Calumet region. Let us investigate and take into ourselves the hunting and gathering life of the Pottawatomie and the struggles of Joseph Bailly, also a hunter and gatherer but with trade ties to a wider world. The long days of a farmer in a corn or wheat field and the equally long days of the early mill worker turning raw ore into hard steel, also belongs in our history.

Change and continuity are the body and locomotive power of history. Change and continuity are also embedded in the ecological developments of the south bay of Lake Michigan. At Indiana Dunes National Lakeshore, history and ecology are intertwined. Eras of man overlap, one leading to the other, starting with a simple use of what nature gives to a highly technological series of methods to gain an end product or combination of products. For example, it should not seem strange to discover

that today's highways follow closely the four major Indian trails that were thought out and traveled several centuries ago. Even the towns of Michigan City and Valparaiso are located upon or remain close to what once were villages of the Pottawatomies. The industrial era of the Calumet, the pioneer, and agricultural eras, are all creations of man's original ideas and relationships with the land.

Every living society is in a state of constant change. Values and ethics of that society evolve as part of that society in a particular time and place. Environmental education works toward a feeling, a kinship to this change.

When the Indian first looked upon the Calumet region, he was basically looking for a land to satisfy his physiological needs. For thousands of years before, the balance of nature lay undisturbed without man's influence of change. Change was there but it was natural. It was part of the process that assured continuity of the "balance of nature."

The Indian was quick to learn from his environment. His impact upon the "balance of nature" was not significant. He blended in well with his surroundings and imitated its ways. He observed some of the processes of nature without having scientific names for them. He did not have a conscious "environmental ethic" for the land. It was part and parcel of his life patterns. His kinship to nature was related to how the land could provide food, shelter, play, and the other necessities of life. He watched the seasons change and evolved his life style from this great phenomenon. He probably followed the wild game and from this activity began to see the easiest direction of travel. As time passed,

the game trails evolved into a system of trails which linked together villages and nations of Indians.[5] There were interactions of the different tribes as they moved about, hunted and fished, held battles and ceremonies, had children, and raised families in this new found land.

Eventually trails evolved into four main systems:

1. Shoreline Trail or Lakeshore Trail. An almost natural trail that ran from the Green Bay area to the Detroit-Lake St. Clair area. The Pottawatomie, originally inhabiting the northwest shore of Lake Michigan, entered the Calumet region along this trail.

2. Sauk Trail. One of the most important trails that had far reaching branches was the Sauk Trail. This trail connected the Mississippi to the Lake Michigan area. It also extended eastward to New England, west to Omaha, and then divided into the southwest Santa Fe Trail and the northwest Oregon Trail. This trail coincides closely with modern routes Indiana 2-Lincoln Highway, US 30.

3. Vincennes Trace, also known as The Pottawatomie Trail, or Hubbard Trace. This trail was used extensively as a military and pioneer route. The trail crossed the Calumet from south to north a few

---

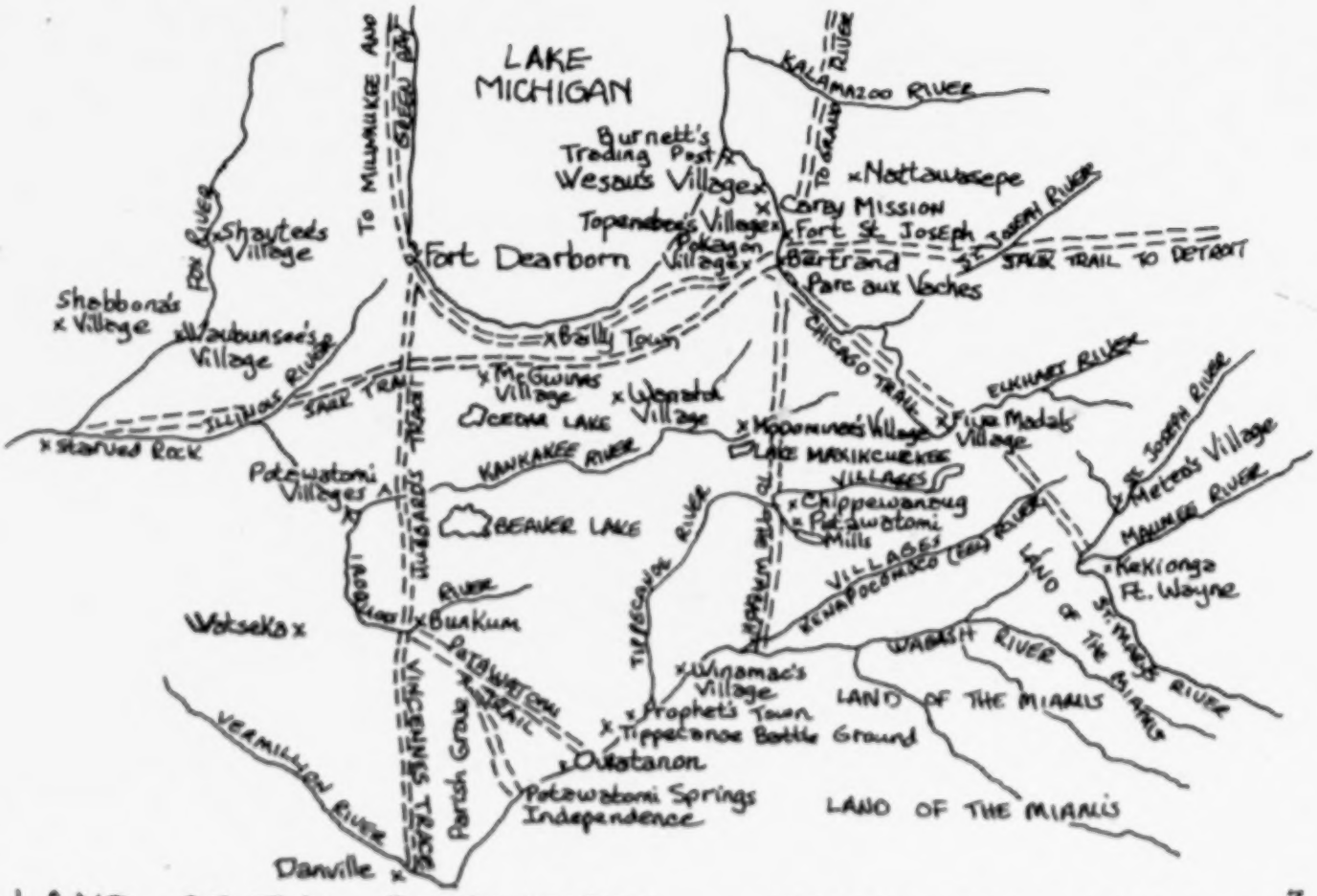
[5]Alfred H. Meyer, Circulation and Settlement Patterns of the Calumet Region of Northwest Indiana and Northeast Illinois (The First Stage of Occupance-The Pottawatomie and the Fur Trader-1830). Reprint from "Annals of the Association of American Geographers," Vol XLIV, September, 1954, No.3, p. 245-274.

miles west of the present Indiana-Illinois state line.

4. Calumet Beach Trail or Tolleston Beach Trail, now US 12 and US 20. This inland route from Michigan City to Chicago follows essentially the Little Calumet River to Bailly Town.[6]

---

[6] Ibid.



LAND OF THE POTAWATOMI — TRAILS AND VILLAGES[7]

[7] John O. Bowers, Dream Cities of the Calumet, Calumet Press, Gary, Indiana, 1929.

Situated short distances from the major trails, smoke could sometimes be seen curling up from some temporary Indian village. Life in the village was primitive compared to present day standards; yet nature provided. The Indian was keenly aware of the dependence he had upon nature. In cold seasons he would often select sheltered locations near a lake or stream. In the warm season he picked the highest wooded hills to settle for a time. His constant moving from place to place gave the land time to repair any damage left behind. Natural food supplies were available for those who put forth the effort. Nuts were provided by trees such as the hazel, hickory, walnut, and beech. Pawpaws could be picked. Wild grapes and other fruits such as currants, gooseberries, and sand hill cherries were abundant. Wild rice grew in the marshes. The wooded areas and nearby prairies provided meat. Buffalo and elk, wild turkeys and duck, squirrel and rabbit all provided a source of food and clothing. Beaver and muskrat also provided clothing. Although not known as farmers, on occasion the Indians did raise small patches of corn, peas, beans, and squash.

For many centuries the Indians with their adapted life style, were the only human factor in the Calumet region. Man has inherited many things from these first inhabitants. Names of rivers, towns, and counties tie the present to the past. Man rides very close to where Indians walked. He still eats some of the same foods and uses some of the same medicines they depended upon. His blood has been mixed with theirs and many of their ideas are part of present day heritage. Most important, they set the stage, in their own way, for change to occur in their relationships

with the first pioneers who entered the land.

Eras of man, land, or animals are never well defined. This is as it should be. It assures continuity. Periods often overlap and change most often occurs slowly. This is what happened in the Calumet region. As early as 1666 Jesuit missionaries passed through the area. The French built Little Fort near Dunes State Park in 1750 and in 1803 Fort Dearborn, present day Chicago, was begun.

The first permanent settlement in the Calumet region was started in 1822 by Joseph Bailly. Joseph Bailly already had a fascinating life. Born in Quebec in 1774, he spent many early years learning the fur trade. His life from 1822 until his death in 1835, however, is the main concern here. Feel the presence of history at the Homestead today. Several log buildings remain. It was here that Bailly came with his family and fulfilled some of his dreams. His interaction with the land, the Indians, his family, and friends stands as a remembrance of how this region began to change from wilderness to an industrial megalopolis.

Joseph Bailly came here with his Indian wife, Marie, their children, Esther, Rose, Eleanor, Robert, and a step-daughter, Teresa. Robert died at age 10 and is buried in the cemetery near the Homestead. Like Bailly, the rest of the family had interesting lives and were associated with the Homestead at various times until 1917. His granddaughter, Frances Howe, died in 1917 and the Homestead went to Louis G. Horne from September 1 to September 23, 1919, and then passed to the School Sisters of Notre Dame of the Lake, Milwaukee, Wisconsin. The Homestead was used

as a summer retreat until it was sold to Joseph S. and Alma LaRoche on August 6, 1946. These people lived there until May 25, 1965 and deeded the property to Joseph E. and Effie Rork. It became a historical site of Indiana Dunes National Lakeshore on November 11, 1971.[8]

The importance of the Bailly Homestead as an environmental study area is obvious. It speaks of interaction and of the interdependence of a man, his family, and the native Americans that inhabited the land. The Homestead was a place of human feelings, of trading furs for necessities of life, of rest and play, and of the beginning change of a wild land evolving into homes and businesses and industries for people of all ethnic backgrounds. Life styles in comparison with today and a recognition of the varieties and similarities of people's relationship to the environment tie the participant to past history of the Bailly Homestead. The Homestead was a cultural and religious oasis for the Ottawa, Pottawatomies, and travelers from many walks of life. It was also a place of trading. The interaction of human lives outshines all other historical facts.

Joseph Bailly spent thirteen years of his life as the only settler in the region. His death in 1835 happened at the time when the sale of land by the federal government began. The following years were chaos. Settlers came and went after brief stays of two or three years. Men of dreams tried their hand at developing cities while others came for quick

---

[8]Harry W. Pfanz and Russel Jones, Bailly Homestead Historic Structures Report, National Park Service, Denver Service Center, Colorado, November, 1972, p. 4-5.

profit ventures. Old Indian trails laid out many years before played a role. Some trails were abandoned, others were used as pioneer roads. Travel was difficult and transportation problems plagued the farmer and the dreamer. Speculators were busy planning harbors and cities along Lake Michigan while settlers and farmers remained isolated, living and working closely with the land.

Nevertheless, a change was rapidly occurring. A stage route between Detroit and Chicago was established in 1833. Some people came by boat across Lake Michigan, weather permitting. Taverns and inns sprang up along major routes. Railroad companies in the east began clamoring for routes to Chicago and 1850 marked the beginning of the railroad toward Chicago. As railroads penetrated the region, settlements sprang up. Farm products soon had a better method of being transported, and people had a means of travel. Fertile prairie soils around and near the swamps yielded corn, oats, hay, and potatoes. Markets for eggs, poultry, and dairy products became available. Churches, homes, and businesses were improved and modernized.

The land was changing along with the people. Swamps and marshes were drained, replaced by businesses or industries or were used for farming. Products of nature were soon discovered to be saleable rather than obstacles hindering progress. Sand and clay were being shipped great distances. Even the ice from lakes and rivers became a product for sale. Fishing and timber provided livelihoods for many. Pioneer life was soon forgotten by most as the land and the people changed their life styles.

The first phase of the industrial development was quickly coming to pass with no thoughts or feelings toward a consequence of relationships between man and the land.

Changes occurred at the Homestead during this era. Look at the existing buildings today. Joseph laid the foundation of the "big house" in 1834, a year before he died. He had plans to build an elegant structure. He had already developed a plan to build a town with a roadway in front of his house as one of the main routes into town.

Much of the information on the changes of the house from 1836 to 1917 is fragmentary. There is, however, enough valid information to show that change took place (or did not take place) according to who was living there at the time.

The structures, existing today, that underwent change after Bailly's death included:

1. The Bailly House. This was originally a hewn timber house of cedar and oak logs two-and-a-half stories high. After Bailly's death and after completion of the basic structure, Bailly's daughter, Esther, and her family lived there. When Esther moved, Francis Howe, Bailly's son-in-law, lived there with his family, sold timber to the incoming railroad and accommodated railroad workers until he died in 1856. From that time on, the widows Bailly and Howe lived there at various times until Mrs. Bailly died in 1866. In 1869 Mrs. Howe took the family to Europe for five years. She returned to Chicago to live sometime in the early

1870's. The house had been neglected during the time she was living in Chicago. In 1891 she returned to the Homestead and had major repairs done by Peter G. Larson. Mrs. Howe lived at the Homestead until her death in 1918. The place was then sold to the School Sisters of Notre Dame for a summer retreat for ill sisters until 1932. Few repairs were started during this period. Although the Homestead passed into private hands after 1932, no major alterations of the main structure have ever been made. One of the owners, the La Roches, repaired and replaced some flooring and poured a concrete basement. Another owner, Joseph Rork, used the house as a restaurant but confined his remodeling to the addition of a cinder block kitchen on the southeast corner of the house. He enclosed the front porch and installed toilets in the basement.

2. The Coachman's House (two-story quarters). This log structure was combined from two original structures of Bailly's time, the dairy house and a tool house, sometime prior to 1903. The house was used occasionally as an overnight dwelling place for guests during Mrs. Howe's occupancy of the Homestead.

3. The Storehouse. During Bailly's time this structure was set aside for a storage facility for Indian friends trapping and hunting in the area. The present structure is a remnant of the original building supplemented by materials salvaged from other buildings.

The concrete calking and tar paper roofs of this log dwelling most likely came after the turn of the century.

4. The Chapel-Kitchen. This, too, is a remnant of other log structures, probably a log house and the original log kitchen. Both Joseph and Marie died in the kitchen. This prompted Frances Howe to convert the salvaged portion of the house and kitchen to a memorial chapel. This was completed during her European trip.

5. The Brick House. This two-story structure was built during the 1880's for Joseph's granddaughter, Rose. The building was originally adjacent to the southeast corner of the Bailly House with the second floor connected by a short bridge to the main house. The house was moved to its present location about 1904 to be used as a dwelling.[9]

The structures you see today are representative of a changing society from 1850 until about 1917. As the Calumet region changed, the people changed too, adapting their life styles to the abundance of nature which they had found.

Man was greatly influenced by the coming of the railroad. Rail transportation was dependent directly or indirectly upon the way the Calumet region was geographically laid out. Man was dependent, too, upon land and water. There was coal to the south and east brought by rail and

---

[9] Ibid., p. 12-22.

iron ore to the north brought by water barges. Today, there are steel mills and refineries, factories and cement plants, publishing companies and supermarkets. There are over 200 different industries manufacturing over 1,000 products to be consumed by people satisfying real and imaginary needs.

CHAPTER II

POTENTIAL ENVIRONMENTAL STUDY AREAS FOR INDIANA DUNES NATIONAL LAKESHORE

The Bailly Homestead is only one of six major areas of the Lakeshore with potential for use in environmental education. In addition there are two sites not in the Park which offer opportunities for further study. Although this booklet is concerned primarily with presenting a guide for the user of the Bailly Homestead area, the possibilities for use of the other sites should not be ignored. Each, including the Bailly Homestead, will be briefly described in this booklet, and a theme for environmental study will also be suggested.

The Bailly Homestead Environmental Study Area includes: the Bailly Homestead, Bailly Cemetery, and Chellberg Farm. Pioneer Joseph Bailly settled along the Little Calumet River in northwest Indiana in 1822 where his family and two consecutive generations of "Bailly's" resided until approximately 1918 at which time the property passed from family ownership. Several members of the family including Joseph are buried in the Bailly Cemetery located approximately eight-tenths mile north-northeast from the Homestead. The Chellberg farmhouse was constructed in 1885.

Geographers and historians refer to four eras of man in northwest Indiana: Indian, pioneer, agriculture, and industrial. There is no distinct line between any of these four eras. The physiography of the Homestead land consists of sand dunes dating back some 12,000 to 14,000 years now stabilized with deciduous hardwoods from the eastern forests.

The Homestead is not just one isolated segment of the lands that comprise the Lakeshore or that of a larger region, just as the interpretive story is not just Joseph Bailly, the fur-trader. Through their religion, close family ties, and fair dealings with their fellowman, the Bailly family had a definite cultural impact on many of the native people of the Calumet region. The Bailly story reveals a portion of the pioneer and early agricultural eras.

The Chellberg Farm denotes remnants from early farm use dating from the turn of the century. How the farm lands were utilized, how these lands changed, and interrelations with the Homestead makes both areas more relevant to park visitors. The Bailly Homestead Environmental Study Area is only one place that can be interlocked with other areas regarding potential environmental study areas, thus making a whole.

Little information has been gathered in regard to the history of the Chellberg Farm. However, at this time it is not important to know who the original family was, or what their story involved. What is important is to recognize the evolving landscape and man's impact on the resources, the early farmer's way of life, his culture, and how a new era developed.

A "living farm," a "demonstration farm" of the early 1900's has been recommended for the development of this site. Visitor participation in farm chores is a projected use as a means of interpretation. The Bailly Homestead Environmental Study Area can be easily tied into the Chellberg Farm by showing man's interrelations and interdependence with the land. These relationships began with the first "natural farmers" of the Calumet, the Indians, and existed through the pioneer and agriculture decades that followed.

Cowles Bog is the second area chosen for its potential in environmental education. During the latter years of the nineteenth century interdunal areas as well as dunes became the primary interest for many biologists from Chicago. Dr. Henry C. Cowles' scientific conclusions have led to him being credited as being the father of ecology. Many of his scientific observations were in the sand dune country bordering the southern end of Lake Michigan. The Bog became a Registered Natural Landmark in 1965 in honor of the late Dr. Cowles. Since Cowles' time the dunes country has remained an educational resource for many universities, colleges, and high schools.

The focal point for an environmental study area in Cowles Bog should include several major points. First, the natural processes involving dune growth, plant succession, and animal communities could be observed and studied. Secondly, man has altered the adjoining landscape by building a town, a power plant, steel mill, highways, and railroad. These physical adaptations have interacted with the landscape; these

processes could also be observed and studied. And third, educators can stress the need for scientific research in utilizing the total environment as an outdoor laboratory. The dunes is an excellent place to learn there are no side effects, just direct effects. It is ironic that the place where natural laws for ecology were formulated also consists of some of the most industrialized portions of our nation.

Third and perhaps most spectacular area in the Lakeshore is Mt. Baldy. If a person were on top of a fire or lookout tower in a western park or forest, he could get an eagle's view of the world around him. This view usually would appear static with only minor changes. From Mt. Baldy, on the other hand, can be seen at least two dynamic forces in action almost continuously; the northern side is undergoing erosion by wave action while the southern side is moving because the wind makes the dune "alive." From on top of the dune, a person gets a dramatic view of the skyline of Chicago, or watches the ore boats out in Lake Michigan enroute to deliver their goods or pick up new cargoes. A marina, a jetty, and lighthouse are also in view. A dredge may be working to remove some of the debris in the creek or dumping sand in the offshore currents. An old power plant is in operation; so is a new one that is nuclear. One may look into Michigan City as well as inside the "grounds" of the State Penitentiary.

Mt. Baldy is a new dune probably dating back approximately two thousand years. Dune growth, movement, and erosion can be studied. Walk down the beaches going west from Michigan City and witness changes and

adaptations from the forces of nature; roads have disappeared, sand dunes have been undercut and slid or simply have blown away.

Mt. Baldy by itself is only another grain of sand, but interlocked together with its adjacent views and resources it becomes another link in the story of this regional environment.

Pinhook Bog is another Registered Natural Landmark within the Indiana Dunes National Lakeshore, and a choice environmental study area. This small and fragile area is the only quaking bog of the Lakeshore and is considered one of the finest sphagnum bogs in Indiana.

Up to the present time access is only through private property. The bog is in high demand from biologists and botanists in getting their school groups out for scientific studies. An environmental study area here should be controlled and limited to a reservation basis only. All natural processes found in the bog to forest complex could be interpreted as well as studies involving man's impact on the lands (the Indiana Toll Road, drainage from roads, and a pile of road salt) adjacent to and affecting the bog.

Much more accessible is Tremont Environmental Study Area. This area is being developed on a stabilized dune approximately 11,000 years old from the Calumet Stage of Lake Chicago. A trail has been developed to orient the user to the various species and interrelationships found in a subclimax oak forest. The loop trail also covers various small blowouts, lowland wet areas, and travels around the edge of a marsh. The trail will serve both the family type visitor as well as organized groups.

The environmental study area should be expanded due to an increased interest in the natural history of these particular dunes. Nowhere else in the Lakeshore are the three former Lake Chicago (Michigan) stages so clearly represented than the route north on Kemil Road. A loop trail should be designed with vistas from the Glenwood, Calumet, and Tolleston dune ridges. The recent dunes should also be interpreted as well as the climatic factors that influence the building or tearing away of dunes and their vegetation. On the return trip, plant succession and animal communities could be interpreted starting with bare dunes and beach grass stages to the climax beech-maple forests.

The Lake has indirectly affected east to west travelers through this region. The environmental study area should also focus in on man and his relationship to the natural environment. The following questions could be raised: where are the highways and railroad systems found (on or near former lake levels or dune ridges); where were the Indian trails; where have people built their complex homes, business, and industries?

The last area within the Lakeshore is primarily a recreational area, West Beach. Even so, it has a tremendous potential in becoming a vital link in the rest of the environmental education system of the Lakeshore. The complete five-hundred-acre complex is made up of new dunes (younger than two thousand years), interdunal ponds, marshes, and a small lake. There is at least one "living" dune, several bare dunes, stabalized dunes, forests, and a major section of sand-mined "flat" dunes. A water works (public service) and town are on one side, apartments and a

city on another side, two railroads and a major highway on the third side, and Lake Michigan on the fourth. From the lakefront on a clear day an individual may easily see the skyline from Chicago to Gary, or Burns Harbor to Michigan City.

Sand has made an impact on man's life; so have the waters of Lake Michigan. Man has utilized both in the development of this region. Man's relationships to the dunes are complex and also in many ways very subtle. The vegetation is also subtle. In this array of dunes one discovers the merging of three vegetational zones: pines and bear berry from the northern coniferous forests, grasses and cacti from the prairie region, and shrubs and hardwoods from the eastern deciduous forests. In these dunes there is a definite environmental education story to tell.

In each of the preceding topics (NPS Lands), the involvement of man's interrelationships as well as complex ecosystems without man have been discussed. Natural history as well as ecosystems include man; however, frequently man is not thought of as a "natural being" along with plants and animals. Authorities who refer to wildlife usually do not mean just animals, but actually wildlife means both plants and animals. Looking back over each potential environmental study area focus momentarily only on suggested aspects of man's involvement:

Bailly Homestead and Chellberg Farm - Indian, pioneer, agriculture era.

Cowles Bog - research, industrial area.

Mt. Baldy - cities, power, penal institution.

Pinhook Bog - environmental effects from man.

Tremont - transportation.

West Beach - exploitation and development.

The story of man in this region can be related to the entire list. This relationship can be extended to include the entire Great Lakes region, the Midwest, or just as easily be extended to include all of North America, or the entire world.

The two non-Lakeshore areas for possible environmental education are the US Army Nike Base, and "Hub." The Nike base, as it now stands, is already a topic for discussion for man's use and impact on the land. All animals defend their territories, their populations, and/or themselves; so does man.

The potential here for environmental education is to maintain the existing facilities for a resident program (NEED - National Environmental Education Development) in case the Army ever decides to leave. The present base is adjacent to the Chellberg Farm and Bailly Cemetery, and only a short walk to either Cowles Bog or the Bailly Homestead.

The "Hub" referred to above as an environmental education area is the "transportation hub" of the United States. Man has to travel down and around or across Lake Michigan in order to go from east to west and vice versa in the rich northern agricultural and industrial section of the United States. Indian trails became wagon routes for the pioneers, and later became state and U. S. highways for modern-day travel. There are still markers on US 12 that state "Dunes Highway, shortest route from the

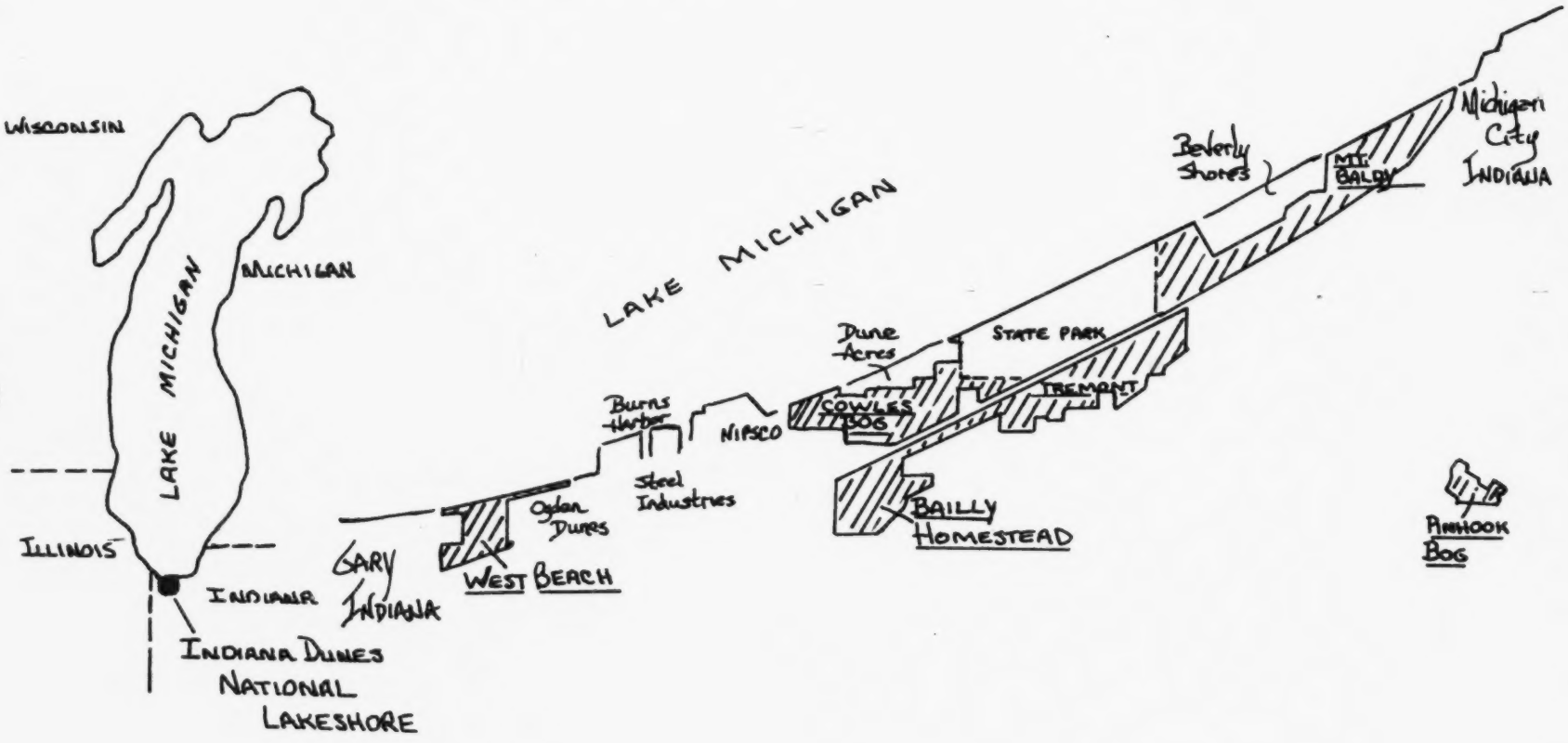
Atlantic to the Pacific." This transportation hub influenced greatly the growth of Detroit and Chicago. Today both giant cities or organisms are joined together with the highway Interstate 94 as the artery.

Moving along this artery, a traveler finds the four different eras of man that historians write about, in one small section of approximately twelve miles. In these four eras what is noticed the most is what stands out visually--the industrial era. Along US 12, from Michigan City to Gary, Indiana, a person may notice industries that produce concrete, chemicals, steel, and electricity from atomic power. There are other commercial industries or corporations such as the Port of Indiana, water works, trucking, boating, sand hauling, railroad systems, garbage dumps, and so on. One may not notice many barns or windmills because most of the land has been adapted to the newer world of industry and technology.

The "hub" environmental study area, which is based on a broader view of environmental education, should include trips to jetties, dikes, power plants, steel mills, transportation centers, garbage dumps, planned communities, etc., to include all major land-uses of this region. Man has created these artificial components from nature; these individual parts are interrelated and inter-linked with other parts, and with man, thereby forming "web of life" relationships. Cities cannot survive without power, sanitation facilities, garbage dumps, water, or transportation routes for man to travel by, nor can cities survive without man's interdependence. Nature has created a web of life that dictates survival for

all species; people too are dependent upon the sun, the soil, the water, and the air for life.

By studying each of these six or eight areas separately or by combining all areas into one, the participant can study man and his culture. He can follow the changes, adaptations, and extinctions of cultural groups in this immediate environment for the specific eras mentioned.



POTENTIAL ENVIRONMENTAL STUDY AREAS FOR INDIANA DUNES NATIONAL LAKESHORE[10]

[10]Above map adapted from the map "The Environs," Interpretive Prospectus, Indiana Dunes National Lakeshore, 1971, p. 5.

CHAPTER III

BAILLY HOMESTEAD ENVIRONMENTAL STUDY AREA

The Bailly Homestead Environmental Study Area is the first environmental study area developed at the Indiana Dunes National Lakeshore. The Homestead area for environmental education purposes, includes the Bailly Cemetery, and Chellberg Farm. Five other environmental study areas for the Lakeshore are planned developments in the future.

The National Park Service objectives in this environmental study area program are:

> To introduce the participant to his total cultural and natural environment, past and present, and help him realize that he is a part of it.
>
> To develop in the participant an understanding of how man is using and misusing his resources.
>
> To provide an opportunity for the participant to work directly with environmental problem solving.
>
> To equip the participant to be a responsible member of the world that he is shaping and that is shaping him.[11]

Environmental study areas are managed as day use areas. Participants are encouraged to plan repeated trips to the sites.

---

[11] National Education Association, Man and His Environment, National Education Association, Washington D. C., 1970, p. 11.

Planning Your Trip to Bailly Homestead

Before planning your class or group trip, first become thoroughly familar with the site and its resources. The following information will be helpful in using the Bailly Homestead Environmental Study Area:

1. Collecting of any specimens must be done with discretion. Any questions regarding this policy and your activities should be discussed with the environmental education specialist at the Lakeshore. A collecting permit can be obtained either at the visitor center or by writing to the Park Superintendent. The permit should be filled out and mailed to the Park Superintendent prior to your trip. Plan to pick up your completed permit at the visitor center.

2. In planning a trip to the site, please notify the environmental education specialist at least one week in advance. The Homestead is a closed area and may be utilized by reservation only.

3. At the present time rest room facilities are available only at the visitor center. Sanitation stations may be provided at the Homestead and at the Farm at a later date.

4. Dress according to current weather conditions. A good pair of boots or shoes is recommended.

5. Best times of the year to visit the environmental study area are in the spring or fall seasons. April and May, and September

through October visits will give a variety of experiences.

6. Hurrying causes accidents. Plan to relax and take plenty of time during your hike and with the activities.

7. Upon arriving at Indiana Dunes National Lakeshore, assemble the group at the visitor center. A park ranger will talk briefly with you and take you to the site.

8. Plan to bring picnic or sack lunches. There are no restaurant or canteen facilities at the study area. Please place your litter in the containers provided.

9. Plan also to bring all of the materials needed for your program. Avoid bulk if possible.

10. It is very important that teachers be familar with the site before bringing out a group. Several teacher workshops will be held each school year; you are invited to attend. The environmental education specialist is available to assist you in any way possible.

11. A trail map is included in this chapter. A list of suggestions for topics of observation and discussion is also included.

12. The Bailly Homestead is rich in both natural history and man's history. The two are inseparable. Studies in art, communication,

math, and other disciplines in relation to this environment can indeed enrich your present schedule. We encourage you to experiment with your own creativity. You'll be suprised at what happens.

The Bailly Trail

The Bailly Trail has been set up to include the Homestead, Cemetery, and Chellberg Farm. The activities in this guide book are not placed in any order of preferred use. Adapt them to your own needs. The trail map is marked with numbers that coincide with the list below. These are only suggestions on some of the observations and relationships you can encounter, there are many, many more. The trail areas are:

1. The initial parking area will begin with the driveway of Chellberg Farm. Avoid all farm structures at this time and follow the marked path southwest to the loop trail. As you complete the loop, the farm era will become more obvious.

2. How large and how old are the big oaks, maples, and beech trees. Are the big old trees without carvings more pleasing to look at than the ones with carvings. How do these trees affect the soil, water table, and other plants? How do they affect you? Perhaps Joseph Bailly and many of his Indian friends hiked parts of this same trail and saw the same trees. What changes have occurred since the first two eras of man?

3. How does the vegetation change from the farm site down to the stream? Is there a stream? Perhaps it is dry--if so, how can you tell that a stream was there? How does nature build dams or combat erosion?

4. Found any dumps lately? What's there? How do things become "junk?" What will happen to these objects?

5. Joseph Bailly arrived here with his family in 1822. The original structures and this land became his home until his death in 1835; his family continued living here until 1918. What would have been some noticeable changes from his arrival here in 1822 until the year 1918? What changes occurred following 1918 to the present time?
   Explore, look around, but also honor the signs. Measure some of the trees in the drive; some are five to seven feet in circumference. Measure the "big" tree.

6. Is it a road, a dumping area, a clearing, or perhaps something else? Notice again, changes in vegetation from one site to another. Are these "weed" plants, or what you would expect to find? Compare these with the ground cover of the forest.

7. How has the vegetation changed in only a few steps? Is the animal hole still there? Is it active; how can you tell? Watch out for the fence.

8. Measure the big oaks. Would you estimate they are seven to nine feet in circumference? Did you find the barbed wire coming out of the side of one or two trees? How did the wire get there; what happens to the tree? Look around for dead logs--what relationships do you find?

9. Measure and compare more trees and speculate their ages. Did these same species of trees once cover this field? Can you feel the furrows with your feet? What is happening to this particular environment?

10. This appears to be an older field than the other; it it? Why? How has man affected these lands?

11. What changes do you find in this area? How do they relate to the other areas--and to you?

12. How does nature move its waters? Where does it all go? How do drainage systems evolve; why do forests need them; why do cities need them?

13. Are there any new plants you haven't seen in the other areas? What's new?

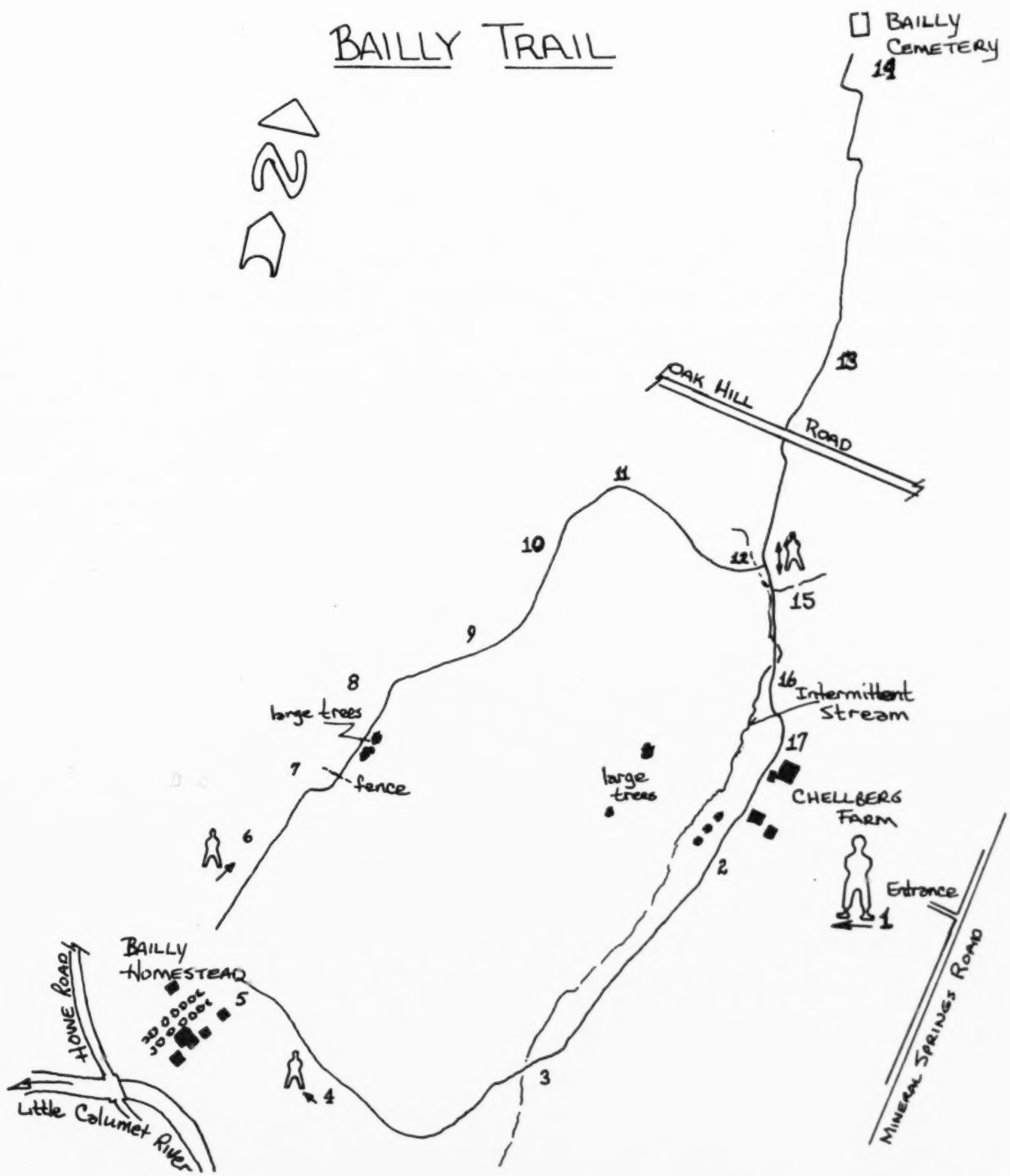
14. How is this cemetery different than most cemeteries?

15. Stop! Look! Listen! Become more aware of individual species

and sounds. Did you find the sweetheart tree? Did you see results from some minor forces of the small stream? How did this stream affect the Farm, the Homestead? How do streams affect our lives; how does it affect you?

16. This farm was founded in approximately 1885. There may have been previous farms on this same site. The farm was last cultivated in 1972 after the previous land owners moved. A "living farm" of the early 1900's is planned for development by the National Park Service in the future.
What kind of farm tools or machinery do you observe? Note the old structures (also observe any NPS signs), fields of dandelions, grass, and mustard plants. What rapid changes occur when man stops farming practices? How much noise do you hear and where does it come from? Do trees buffer sounds from highways? Notice garbage from the farm on steep slopes behind the house. How does this practice of garbage disposal affect the soil, and water table? How does this farm compare to the Bailly Homestead? How does it compare to modern farming?

17. One of the last structures on the trail is a small house adjacent to the big oaks, maples, and beech trees. Was it a house to make maple syrup? How were the ingredients for maple syrup collected? How is syrup made today? How does this farm, or any farm relate to your own environment?


BAILLY TRAIL
BAILLY CEMETERY
14
13
OAK HILL ROAD
11
10
12
15
9
8
16
Intermittent Stream
large trees
17
7
fence
large trees
CHELLBERG FARM
6
2
Entrance
1
BAILLY HOMESTEAD
HOWE ROAD
5
3
4
Little Calumet River
MINERAL SPRINGS ROAD

CHAPTER IV

ENVIRONMENTAL EDUCATION AND SELECTED EDUCATIONAL ACTIVITIES

The selected educational activity section of this chapter has been designed specifically for the Bailly Homestead Environmental Study Area. The key to using these activities rests on the response of the individuals to the Environmental Strands. By understanding the Strands we can more easily relate to environmental education.[12]

Environmental Education and the Strands

Five universal concepts have been formulated which can be used at any place, at any time, and in any environment. These concepts collectively are called the Environmental Strands: Variety and Similarity, Patterns, Interaction and Interpendence, Continuity and Change, and Evolution and Adaptation. These concepts are tools for interpreting existing relationships. They exist simultaneously in all things and at all times. Each Strand leads to another Strand as in a sequential pattern.

The first Strand, Variety and Similarity, means simple recognition of each thing, object, or life form. Is it animal, vegetable, or mineral? What are its observable characteristics in colors, shapes, sizes,

---

[12] Ibid.

textures, and functions? Animals adapt and survive because of variations of genetical possibilities. We depend on simple recognition in our thought processes or in communications. We assimilate known characteristics into categorized inventories so that we are capable of recognizing our pets, our homes, and one another.

As more detailed classifications occur, Patterns, the second Strand, can be identified in relation to its design, organization, or function. Our working habits, eating habits, cultures and societies are patterns just as the web of life concepts, the water cycle, and the nitrogen cycle. Life is a pattern. Patterns become the infinite order of all things in the biophysical world.

As the object, thing, or life form evolves to the third Strand, Interaction and Interdependence, its relationship to air, water, soil, sun, and other populations are questioned. These interactions radiate spatial circles interlocking with an infinite number of other spatial circles of other interactions. Nothing exists in isolation.

While interactions occur, the fourth Strand, Continuity and Change, is taking place. The only constant in this universe is change. Continuity can be perceived by examining various cycles of change such as seasons, water cycles, and food chains, and their interrelationships to each other. Life is change just as life is continuity.

Everything is constantly undergoing Evolution and Adaptation, the fifth Strand, as changes occur. Some animals have become extinct; man has grown taller; the landscape is changing through successional adaptations.

Survival traits are passed on from parents to offspring so that adaptation becomes a pattern of life for any species. If adaptation does not occur it evolves to another form.

Through the concepts of the Environmental Strands we can observe relationships in the total environment. Each single component of the environment is related to something else, which in turn forms a web.

Environmental education involves all segments of our total environment. It not only includes the basic components of life; sun, water, soil, and air, but also includes the earth's people, their societies and cultures. Environmental education is the process which man (1) develops a broad understanding of the biophysical environment, (2) becomes more sensitive and more aware of his place and relationship in the environment, and in recognizing environmental problems, (3) searches out ways to improve the environment, and (4) develops an attitude regarding a quality of life. Environmental education leads to an ethic in the man centered world by creating an environment for living, not barely, but beautifully.

The selected educational activities have been designed through the environmental education techniques of the Strands. The Environmental Strands were evident throughout the evolving landscape from glacial Lake Michigan through the four eras of man in northwest Indiana. Recognizing the relationships the Strands pertain to, is what comprises the selected activities. Although these particular activities have been designed for

the Bailly Homestead area, many of these can be adapted for use on school grounds, in the cities, in parking lots, at garbage dumps, in transportation centers, or in any environment as small or as large as you choose to establish.

Selected Educational Activities

The following activities require interaction by teachers and students in a stimulating way. As you learn more about the Bailly Homestead and the "environmental approach," create and experiment with your own ideas. Also, be aware and use the ideas of the students. Out of their response will often come some real insights and tough questions for which answers need to be known.

Over a period of time your own ideas and activities can be typed and added to this guidebook, giving you a wealth of possibilities from which to draw. By all means, consider some type of pre-site activities as an introduction to the Bailly Homestead and some post-site activities to determine the success of the program.

To complete most of the following activities, all the student needs to have is a small pocketsize notebook and pencils or crayons. Additional materials are recommended for the art work exercise. Other materials may be used as desired.

Awareness Walk

Environmental Experience:

To become more familar with using the senses of touch, smell, and sound in the environment.

Active Strands:

Interaction and Interdependence, Variety and Similarities.

Procedure:

For most of this exercise, blindfolds are needed for each participant.

1. No excessive talking is allowed. Individuals walk for ten minutes and write down observations regarding sights, sounds, and smells.

2. Participants are paired off. One person in each pair is blindfolded and is led by his (her) partner. With as little verbal communication as possible the blindfolded participant is encouraged to use his other senses in getting acquainted with his environment.

3. Second participant protects and guides his partner. Non-verbal communication is encouraged. (Leader needs to have small groups; and to keep pairs reasonable close together).

4. After approximately twenty minutes, participants switch roles.

5. Optional: Leader(s) takes individuals to various trees and each participant is asked to get acquainted with a new tree friend in five minutes. Leader then returns and removes individual to a reasonable distance, spins the individual around to confuse direction, and then allows the participant to remove blindfold. Participant is them given several minutes to find the tree friend. (Several leaders are needed for this exercise).

Discussion:

1. What observations did you make while not being blindfolded? Were you aware of sounds, odors, and textures?

2. Did you become more sensitive in using your senses after you

were blindfolded?

3. How did you feel being blindfolded?

4. What was your relationship to the sun, to the warmth or coolness in an open or more sheltered environment?

5. Did being blindfolded help you become more inquisitive and perhaps more perceptive of your environment? How?

6. What objects, smells, sounds, textures, did you notice being blindfolded that you did not notice while not being blindfolded?

7. Optional experience: Did you find your tree friend, if so, how did this affect you? What did you observe about the tree's environment that perhaps you would not have noticed otherwise?

Becoming Aware of Motion

Environmental Experience:

To study shapes, motions, and appearances.

Active Strands:

Interaction, Variety and Similarities.

Procedure:

Have each person look for five different objects in motion. For example, objects that are dancing or running. Ask them to determine why the object dances or moves. Some examples might be grass, leaves, window shutters, wires, and waves.

Discussion:

1. How is the movement you saw similar to a dance?

2. What are the causes of movement of the objects you observed?

3. How is your own movement caused. Is it like a dance?

Listening and Thinking

Environmental Experience:

To become more aware of sounds and learn what they mean to you.

Active Strand:

Variety and Similarities.

Procedure:

Have the student find a place away from everyone. Take about five minutes; ask them to listen for sounds that carry some message to them. Have them pick out and list the sounds they hear. Encourage them to choose sounds that make them think of something in their life--that reminds them of something else. Reassemble and share the experience with the group.

Discussion:

1. What sounds do you like? Why?
2. What sounds are unpleasant? Why?
3. What sounds do you think Joseph Bailly heard?
4. What sounds do you think Joseph Bailly did not hear?
5. Which sounds would have been unpleasant to Bailly? Why?

Focusing In

Environmental Experience:

To focus in on and become aware of comparisons of the natural and man-made environment.

Active Strands:

Continuity and Change, Evolution and Adaptation.

Procedure:

Have each person take a T.V. view facing a direction. They can do this by cupping their hands around their eyes. This

helps them focus in on a small area. Ask them to observe the natural and man-made objects. They may take as many views as they like, each in a different direction. Gather as a group and compare the views.

Discussion:

1. Did some of the objects seem to intrude upon the natural setting? Why?

2. What do you think stood out the most? Why?

3. What do you think could be done to make your views more beautiful?

4. Do man-made objects always contrast with the natural setting? Why, or why not?

Discovering Emotions

Environmental Experience:

To discover our feelings and how they relate to what we see.

Active Strand:

Interaction and Interdependence.

Procedure:

Ask each participant to find a quiet spot away from everyone else and take fifteen minutes looking for objects that they respond to with various emotional expressions. Examples of emotions might be joy, laughter, sadness, love, hate, fear, pleasure, and hope.

Discussion:

Determine what emotional expressions you experienced that may be recognized.

1. Why do objects bring about an emotion in you?

2. See if the group can agree on a particular object representing a particular emotion.

3. List the objects you observed.

4. List the emotions they represent.

5. What objects brought what emotions to expression by you?

6. Why those particular objects and those emotions?

Sensory Wheel

Environmental Experience:

To gain a feeling of closeness with the environment.

Active Strands:

Interaction and Adaptation.

Procedure:

This activity is one of close association. Pick a spot in tall grass or in a somewhat green woodland. Lie down face up in a circle forming a wheel. Move in close enough to have each person touching and relaxed. Have each person remain quiet for several minutes. Then have them feel the ground and other objects lying nearby. Ask them about the things they noticed and felt during the quiet time. Ask them to purposefully watch for any cares and anxieties that flow away. Then ask them to say anything that comes to mind which they would like to share.

Discussion:

1. What did you see?

2. What did you hear?

3. What did you feel?

4. Did you become more aware of the environment?

5. Did you feel a closeness with the group, the persons next to you, the ground?

6. What did you notice about the sky? How did you feel as you looked into the sky?

7. Did your anxieties seem to disappear?

Living the Past

Environmental Experience:

To experience dependence upon the land.

Active Strands:

Interaction and Interdependence, and Adaptation.

Procedure:

Have each child play the role of Joseph Bailly. He has just arrived at this spot after many days of travel. He has decided that here is the place he will want to spend the rest of his life. There must be reasons why he has picked this location.

Consider the following circumstances. Bailly has a wife and five children. He will want to build a house. He will have to have food and clothing. He will consider what kind of work and play they can do here.

Discussion:

1. Think of five reasons you have chosen this place. Your might have to do some exploring to decide. You will have to think.

2. Look for five types of building materials which you might use in building your house.

3. List five tools you might need.

4. Name other things you will need to survive.

5. See if you can find five sources of food.

6. Find five things you could do for play.

7. Discuss all of the above in a group process.

Chellberg Farm and Bailly Homestead

Environmental Experience:

To become more aware of the changing landscape during the era of man in northern Indiana.

Active Strands:

Patterns, Continuity and Change, and Evolution and Adaptation.

Procedure:

Each place marks a definite era that is duplicated elsewhere in the nation. The Homestead dates back to 1822 with periodic changes through possibly the 1960's. The dates of the farm house structure was 1885, with occupancy until 1972.

1. Have each participant make a list (of five) that relates to each of the above Strands. Make the list first at the Homestead and then at the farm.

2. Have them make a similar list from memory from their own community.

Discussion:

Compare and discuss the lists, and discuss the following questions.

1. Are living conditions better now than in Bailly's time? Why, or why not?

2. How did cultures change from the pioneer era through the agricultural era? How did our present day culture evolve?

3. What influence did Chicago and Michigan City have on the Homestead and the Farm? How did these cities influence the rest of this area? How do they influence us today?

4. How has man's dependence on the landscape shifted?

5. Why should there be an environmental concern? Is there one?

Planning A City

Environmental Experience:

To exercise our thinking in an environmental approach to planning a city.

Active Strands:

Change, Patterns, and Interaction.

Procedure:

Joseph Bailly once had a plan to build a city which would have included the Homestead. Before his death, he prepared a plat dated December 14, 1833. He entitled this plan "Town of Bailly." The streets were named for his wife, his children, and the Great Lakes. He hoped to have a railroad and a canal in the town. His untimely death in 1835 prevented Joseph's dream from becoming a reality.

On the following page is a reproduction of the plan of the town Bailly hoped to build. Have all participants use the outline in laying out the town as they think best.

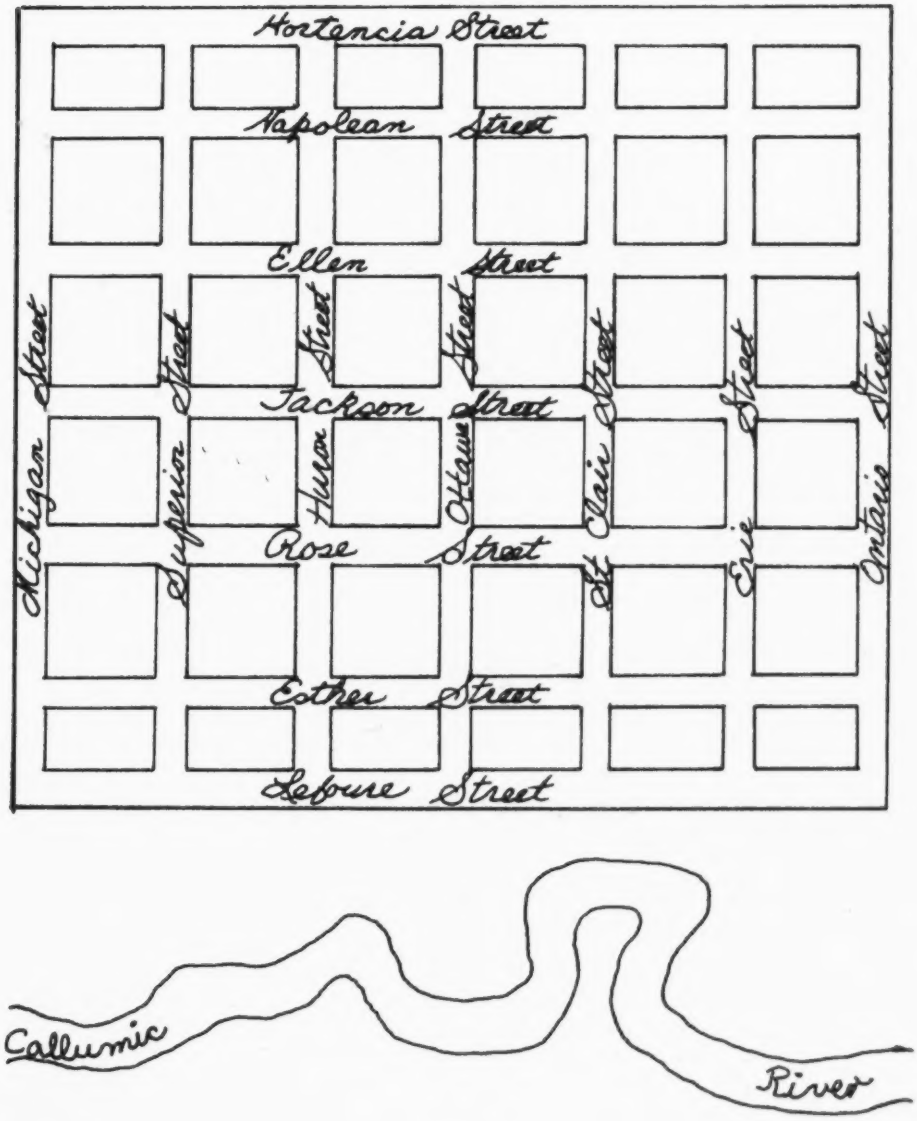
Discussion:

1. Have you considered all of the necessary establishments that make up a town? Compare your lists.
2. Did you plan the town as being functional, liveable, esthetic, and recreational?
3. Where did you put industries and factories? Why?
4. Where did you put homes, schools, and churches? Why?
5. Where did you put recreational facilities? Why?
6. How many people did you decide the town could accomodate?
7. What economic and social factors need to be considered.
8. How will Lake Michigan and the Little Calumet influence the town? What about erosion, and water supply?
9. List the elements you think are present in many cities today that make them unhealthy (noise, smog, water pollution, crime, disease, etc.).

TOWN OF BAILLY[13]

JOSEPH BAILLY PROPRIETOR

DEC. 14 1833



---

[13]John O. Bowers, Dream Cities of the Calumet, Calumet Press, Gary, Indiana, 1929.

Genealogy Table

Environmental Experience:

To relate to a genealogy table of Joseph Bailly and to study how you are related to the past.

Active Strands:

Evolution, Continuity and Change.

Procedure:

The Bailly Cemetery was probably an Indian burial site long ago. It is about a mile from the Homestead. Bailly buried his young son there in 1827. He has an infant daughter buried there. Joseph, himself, was buried there in 1835. Also buried there is his wife, Marie; his daughter, Esther; stepdaughter, Teresa; Mr. and Mrs. Francis Howe, and their daughters, Rose and Frances.

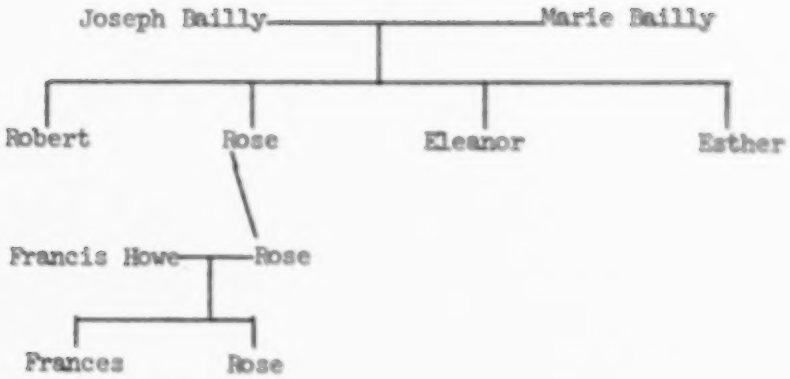
The next page is an example of part of the Bailly family tree. It shows the continuity of the family. Below the Bailly Family Tree are blank spaces for the participants to work out their own family tree. Ask the participants to put their names in the designated space. Now have them work backward (or forward) to see how far they can go with their own genealogy.

Discussion:

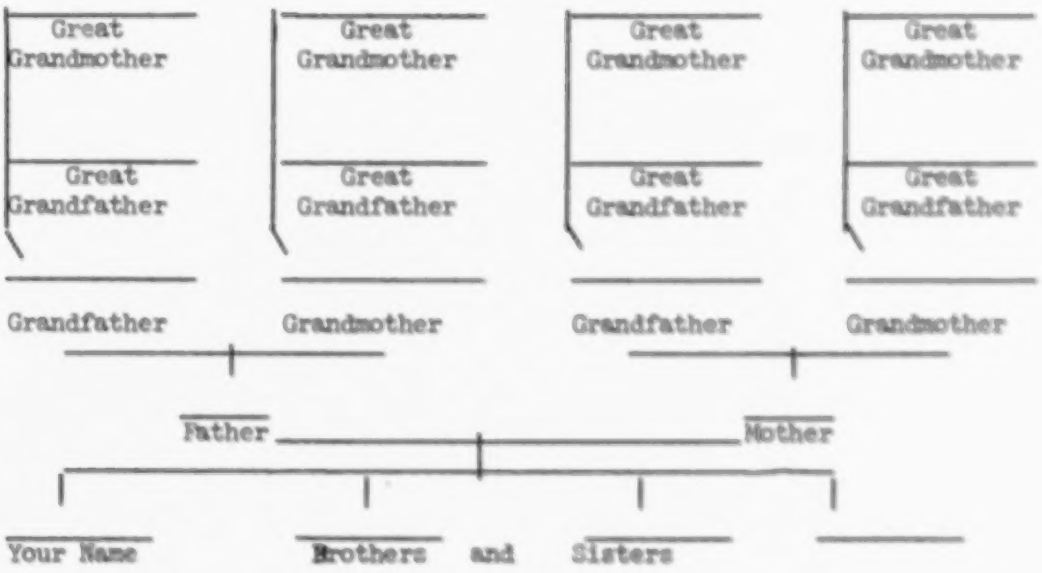
Answer the following questions.

1. Name some important historical events that occurred, during the lifetime of Joseph Bailly.
2. Can you tell the group some of the history of your family?
3. If you cannot fill in some of the blanks, make a list of people or places where you could get the information you need.
4. What does studying your past tell you about yourself?
5. List some ways your relatives fit into major historical events.

Bailly Family:



Your Family:



Setting up Housekeeping

Environmental Experience:

To experience planning a household and repairing rundown conditions.

Active Strands:

Adaption, and Interdependence.

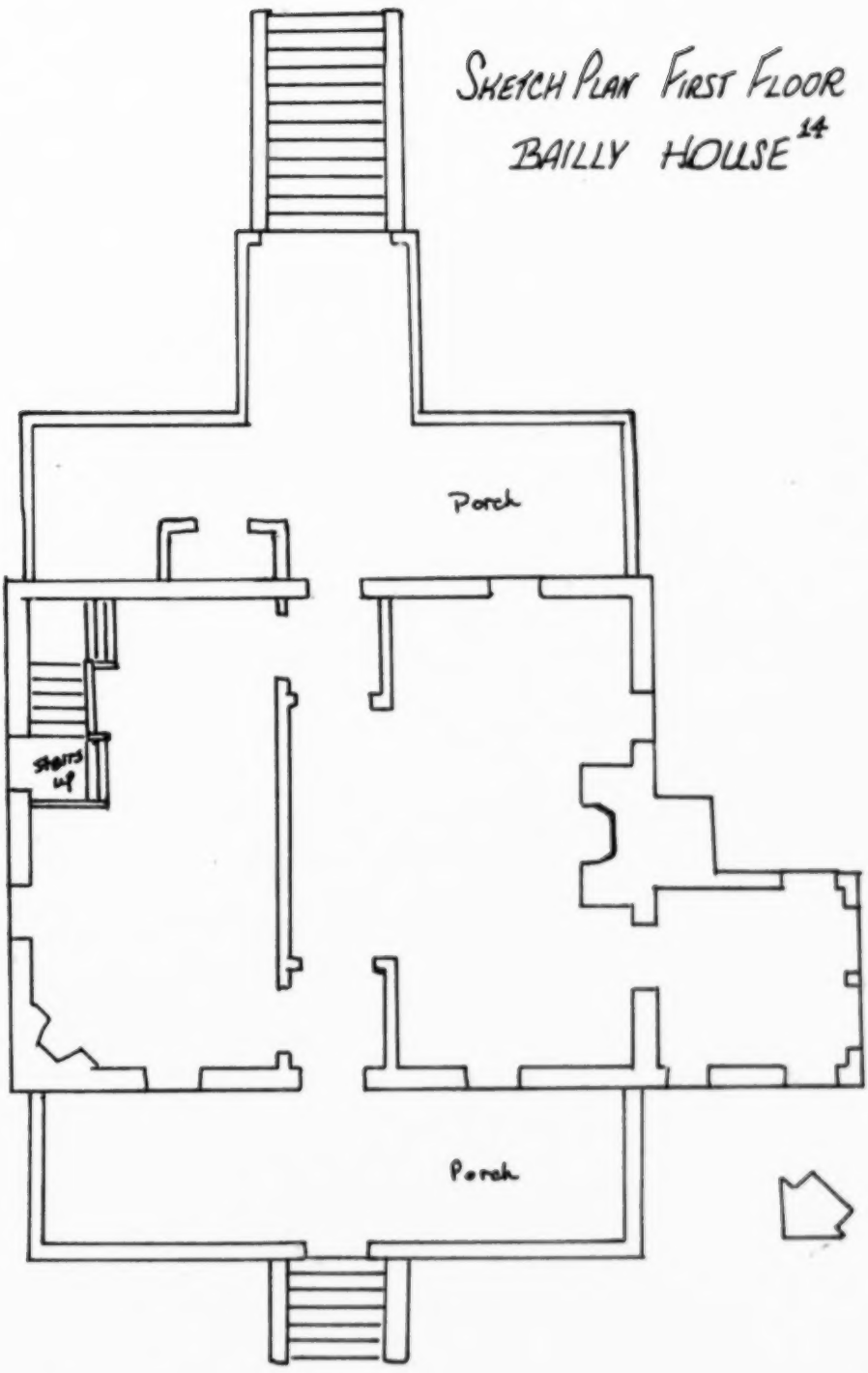
Procedure:

Have the participant choose a partner. One person can play the role of Frances Bailly returning to the Homestead after living in Chicago for many years. The other person can play the role of a carpenter, and caretaker for the Homestead. Together, have the pair plan all of the aspects of making the Homestead liveable.

Each pair will be given a sheet of paper illustrating the first or second floor of the "Big House." They may use crayons or pencils to do anything they like to the arrangement of furniture and use of the floor plan.

Discussion:

1. What will you need to repair the outside of the house?
2. How will you arrange the furniture in the house? (Do this on the floor plan).
3. Decide how many people could live comfortably in the house using the first two floors.
4. Where do you think you could go to get the supplies and materials to make the house liveable? List the places.
5. For what do you think the Homestead and location could best be used? Why?



SKETCH PLAN FIRST FLOOR
BAILLY HOUSE[14]

[14]Harry W. Pfanz and Russel Jones, Bailly Homestead Historical Structures Report, National Park Service, Denver Service Center, 1972, P. 85.

SKETCH PLAN SECOND FLOOR
BAILLY HOUSE[15]

---

[15] Ibid. p. 86

Cleaning up the Environment

Environmental Experience:

To observe the unnatural objects around the Homestead.

Active Strands:

Interaction, Change.

Procedure:

Ask each participant to take fifteen minutes and find one of the trash dumps behind the house, or east of it. Have them pick up several pieces of trash they find lying around. Reassemble as a group and have each person tell a story about how they think that piece of trash got there.

Discussion:

1. Of what is the object made?
2. For what is the object used?
3. Who do you think would use it?
4. Why do you think someone would use it?
5. Is it essential for survival or wellbeing?
6. Are there other ways it could be used besides its normal intended use?
7. Can it be traced back to nature?
8. What do you think the best use of it now would be?
9. What is trash?

Comparing Past and Present

Environmental Experience:

To discover changes and tell why they occur.

Active Strands:

Change, Similarities, Evolution.

Procedure:

Each person is given a duplicate photo which was taken sometime between 1907 and 1965. Have them look carefully at it. Ask each person to walk around and find approximately where the photo was taken.

Discussion:

1. Compare the photo with what you actually see now.
2. List the changes and similarities (natural and man-made) of what you see with what is in the photograph.
3. Why do you think the changes have occurred?

Colors and Relationships

Environmental Experience:

To become more aware of colors in the environment.

Active Strands:

Patterns, Variety and Similarities.

Procedure:

You will need to bring your own art materials. Leader chooses assignment and major area; participants choose specific areas of interest. Time is set by the leader.

Suggestion A.
Participants select focal points of interest and a

particular Strand. Participant then draws in detail his or her perception of how that Strand is found, or is related to the environment.

Suggestion B.
Using paper only, each person goes out and gathers nature's colors from the various species of grasses, leaves (living and dead), tree bark, soils, wildflowers, etc., to create a portrait of the environment. Caution should be exercised in not stripping any one area of its particular wildflowers or other natural elements.

Suggestion C.
Group drawings using one or more of the Strands.

Suggestion D.
Participants collect down and dead materials to arrange for art displays.

Suggestion E.
Free lance creative drawings.

Suggestion F.
Practice studying something in the environment. After the participant feels as though he has absorbed the details, he should turn his back on the subject and draw from memory. After completion he should compare his drawing with the real subject.

Discussion:

1. Ask for volunteers to share their art. Why did they choose their specific topic of interest?

2. How does art affect you?

3. How does art show feelings and emotions? How does the interpreter of the art respond?

4. Why have art? How has it related to man in the past?

5. Did the Indians create art objects? How?

6. How has art been influential in the past? Now?

7. What are other types of art?

8. How does the natural environment influence you in your artwork? Is it different in creating something in nature rather than being indoors?

An Acre

Environmental Experience:

To use communications and mathematical skills in relating to the man-made and natural landscapes.

Active Strands:

Interaction, Evolution and Adaptation.

Procedure:

How large is an acre? (Answer: 43,560 square feet). Have the participants go to an open field; they will need a watch and a ruler to assist them.

Participants form three groups; each group decides who their pacers will be and also measures their length of stride. Each of the three groups decide how to walk off an acre to display their skills to the other two groups; one group should show a square, the second a rectangle, and the third a triangle. Each group forms their acre while the other two groups observe.

Discussion:

1. Who were the leaders in forming your groups? Did you rely on the mathematical expertise of any one individual or was it a group function?

2. What did you notice that was within the confines of your acre? Can all relationships be confined?

3. How large is your classroom, your school, your yard at home in terms of acreage?

4. How many people can play in or use an acre without it being too crowded?

5. Can any of the groups do the same exercise using a circle? Can they do the same in a forest, or on a hillside? What happens if a pond were included?

6. How did pioneers walk off their lands, mark their boundaries, etc.?

7. How has marking off the landscape played a role in the history of man? How has this been adapted to cities today?

Poetry

Environmental Experience:

To learn to be more sensitive to an environment: to capture the many moods of the setting; to communicate individual feelings in relation to the experience.

Active Strands:

Variety and Similarities, Patterns, Interaction and Interdependence, Continuity and Change, or Evolution and Adaptation.

Procedure:

Leader explains Haiku and Cinquain (pronounced "sing cane") poetry forms.

Haiku is a Japanese art form having a set number of syllables per line. It is not necessarily based on rhyme. Line one has five syllables, line two has seven, and line three has five.

Cinquain has a fixed number of lines and a fixed number of syllables per line. Line one has two syllables; line two, four; line three, six; line four, eight; and line five, two. A suggestion would be for line one to contain a noun, line two to describe the noun with two adjectives,

line three to contain three words to tell what the noun is doing, a short phrase for line four, and line five should contain a synonym (or repeat the noun) to relate to the noun in line one.

Examples of both types of poetry are found on the following page. These poems were written at the Bailly Homestead.

Any area will do; however, privacy is a necessity and students should be able to pick specific focal points of interest. Content should relate to one or more of the Strands found in the environment, thoughts or feelings of the environment, or of simple observations. Creative time is needed for the poets to formulate and record their ideas on paper. After the project, ask for volunteers to share their poems.

Discussion:

1. What topics are covered? How do they relate to one another?

2. What was the stimulus in creating your own poem?

3. Regarding your poem, what observations did you make that perhaps would have otherwise gone unnoticed?

4. How did poetry play a role in the history of man?

5. In poetry do some individuals perceive more than others? How may we study poetry to investigate the past?

Poetry at the Bailly Homestead[16]

One time
Joseph Bailly
Lived in the great deep woods
Lived in the woods with the Indians
And birds.

Martha Miller

Bailly
Early settler
Founded this quiet place
We enjoy this lonely Homestead
Today.

Charlotte Read

Trees stripped of bark
Lonely against the graying sky
Yearn for voices gone by.

Merlin Bray

I am an old house
That stood the test of long time
'Till now and all tomorrows.

Log hut
Squared for fine fit
Dwelling for men of past
Old and worn left to die alone
Log hut.

Bill Schaudt

Standing so alone
None to fill its empty rooms
Waiting silently.

Merna Lowey

Silver gray, rough hewn
Shaped into a cabin small
Logs, weathered by time.

Paul T. Swenson

The ice age recedes
Homo sapien appears
Harmony's shattered.

Silence shrouds the past
Man's intelligence seeks
His purpose in plan.

Johnny B. Coulter

Ivy
Twisting, climbing,
Clinging to me for life,
Choking me of my every breath,
Ivy.

Hear the birds singing
Cheerfully in the distance.
Are they listening?

Nature, tell us please
How to live with it today
Tomorrow too late.

Donald Justak

Mysteries in time
Silent are the trees
The walls
Man's history past.

Connie Powers

---

[16]Poems written by participants in a teacher workshop held at Indiana Dunes National Lakeshore, May 12, 1973.

Web of Life

Environmental Experience:

To be in the outdoors for the activity so as to better grasp the interrelationship of the biophysical world.

Active Strand:

Interaction and Interdependence.

Procedure:

Need ball of string, placards, and pen or crayon for naming various components of the biophysical world.

1. Leader asks members to role play one component of their choosing of the biophysical world. Leader should make certain the sun, soil, water, and air are picked in order for a more meaningful exercise to occur. Garbage cans as well as sunflowers may be chosen.

2. As participants pick topics, the string is passed with a placard showing what the participant is role playing. String should crisscross diagonally so a more definite web occurs.

3. After each participant has picked a part and has been interwoven in the web, the string should be passed to the first named player so as to complete the web. (Note - an exact web would show the four basic components of life relating to everything; this would be a cumbersome project and is not actually needed for the desired results).

4. After web is complete, leader asks someone to begin by stating what his role is and who or what are the two components to which he is linked. Then the initial participant states his relationship with each of the two components.

5. Using the third component to state the same and continuing through, everyone should have an opportunity to state his role and relationship to the two other roles. Leader should make certain that no individual is overlooked.

Discussion:

1. The entire procedure is a discussion process.

2. After web is communicated, leader chooses one role to die or break off. What happens? How does this affect everything else?

Ten-Foot Radius

Environmental Experience:

To become more perceptive in the immediate surroundings.

Active Strands:

Variety and Similarities, Interaction and Interdependence.

Procedure:

Participants are given two minutes to decide specific area they wish to investigate further; this becomes their own area of interest. They then go to their focal point and quickly measure off an approximate ten-foot radius. Anything within the radius or anything that directly touches or overhands that radius is to be considered part of that radius.

For the next ten to fifteen minutes they are to write down everything they see and/or relationships they think exist in that area.

Discussion:

1. Why did you choose the particular area you did? What attracted you to that area?

2. What was the largest object in your radius? What was the smallest, the oldest, the youngest, the most beautiful, the least pleasurable to look at?

3. Was there anything there that did not belong there? Did every component have a function?

4. What were some of the relationships you discovered?

5. How do you think your ten-foot radius compares with your neighbors? Are they interrelated? If so, how?

6. What were the common shapes, sizes, textures? What differences did you notice?

7. What changes do you think are occurring in your radius? What changes affect the other components?

Succession Hike

Environmental Experience:

To become more aware of the changing landscape and how nature rules out definite boundaries.

Active Strands:

Continuity and Change, Evolution and Adaptation.

Procedure:

On the trail from Bailly Homestead to Bailly Cemetery you will walk through areas that have been roads, farm fields, orchards, and nature stands of oak, beech, and maple trees. The dunes are very old and were once climax hardwood forests.

Participants should write down their observations involving the changes of the landscape.

Discussion:

1. How many different types of areas did you go through? What made each area different?

2. How did the vegetation of the borders of the fields differ from the vegetation in the fields? What kind of ground cover was in each?

3. Where did you find the largest trees? Why were they in the location you found them?

4. How long will fields remain fields if they are not cultivated?

5. How do changes in a field or in a woodland compare with changes in a city?

Food Chain Past and Present

Environmental Experience:

To become aware of food chains of the past and present.

Active Strands:

Interdependence, Change, and Patterns.

Procedure:

When Joseph Bailly arrived on this spot, deer, bear, elk, and buffalo ranged within the area. Various meats, berries, and wild fruit were abundant. Small game was evident. There was natural food to rely on. The "balance of nature" existed. Predator and prey allowed the food chain to regulate itself.

Today is different. Have each participant compare his life with Joseph Bailly's life. Ask each participant to look around for five minutes for anything they know to be edible. Then ask them to select one food and determine where it fits into the food chain. An example might be a rabbit, a snake, a bird. Finally, ask them to draw a food chain starting with a plant and ending up with man at the top of the chain.

Discussion:

1. What are the differences in the food chains Joseph Bailly experienced and the food chains you might experience?

2. How do you think food chains have changed during the past hundred years?

3. Do people still rely on the food chain? Why or why not?

Discovering Life Cycles

Environmental Experience:

To observe and become aware of active change taking place on the land.

Active Strands:

Change, Interaction.

Procedure:

Have each participant take fifteen minutes and look for the life cycle of an object. Pick out the signs of birth, life, and death. An example might be a tree, a plant, or any creature, alive or dead. Have each person determine from visual observations what appears to be occurring. Then have the participants reassemble and share their experiences.

Discussion:

1. Tell about the things that you saw occurring at the moment of observation.

2. Tell a story of what you think is happening or has happened.

3. In what stage of the life cycle is the object? How can you tell?

4. Draw some parallels with the life cycle of your object with the object of someone else.

CHAPTER V

THE NEXT STEP

Environmental education can be defined for the professional and for the laymen's understanding. Environmental study areas can be set aside and developed for educational purposes so that man can learn of his relationships with the land and with his fellowman. Activities, skills, and techniques, can be created, tried, forgotten; or perhaps stimulate a new environmental awareness, a new environmental ethic. Where does it all lead?

> Interpretation is a voyage of discovery
> in the field of human emotions and
> intellectual growth, and it is hard
> to forsee that time when the
> interpreter can confidently say--
> Now we are wholly adequate
> to our task.[17]

Too often man has used the written word to lock himself to "the only way to do it." In going through a process, the process itself can be lost, ignored or reduced. The written word can become a master of the person and ideas, yet the process and the written word are two of the most important elements for experiencing the environment.

This guidebook should be a tool for measuring an experience, for

---

[17] Freeman Tilden, The Fifth Essence, The National Park Trust Fund Board, Washington, D. C., p. 60.

reflecting on process, for unleasing creativity, for discovering self and place and time.

Use it with the idea in mind that change is taking place. You are different now than a minute ago. Something has been added or subtracted and thus man changes, man lives. And this is the beauty of it all. The process is worth looking back over and thinking about.

The world is subject to change
without notice ...

So should this guide book ...

The next step is up to
You ...

SELECTED BIBLIOGRAPHY

Environmental Education

Duncan, William B. and Harvey, David E. L. I. F. E. Downers Grove, Illinois: George Williams College, 1972.

McInnis, Noel. You Are An Environment. Evanston, Illinois: The Center for Curriculum Design, 1972.

National Education Association. Man and His Environment. Washington, D. C.: National Education Association, 1970.

National Park Foundation. Adventure in Environment. Morristown, New Jersey: Silver Burdett Corp., 1972.

Sale, Larry L. and Lee, Ernest W. Environmental Education in the Elementary School. Chicago, Ill.: Holt, Rinehart and Winston, Inc., 1972.

Schoenfeld, Clay. Outlines of Environmental Education. Madison, Wisc.: Dembar Educational Research Services, Inc., 1971.

Troost, Cornelius J. and Altman, Harold. Environmental Education: A Sourcebook. New York: John Wiley and Sons, Inc., 1972.

U. S. Department of Interior, Interpretive Prospectus for Indiana Dunes National Lakeshore, National Park Service, Washington, D. C. , 1971.

Van Matre, Steve. Acclimatization. Martinsville, Ind.: American Camping Association, 1972.

Environmental Readings

Griffith, Charles J., et al. EP-The New Conservation. Arlington, Virginia: The Izzak Walton League of America, 1971.

Leopold, Aldo. A Sand County Almanac. New York: Oxford University Press, 1966.

Tilden, Freeman. The Fifth Essence. Washington, D. C.: The National Park Trust Fund Board.

Historical

Bowers, John O. Dream Cities of the Calumet. Gary, Ind: Calumet Press, 1929.

Howe, Frances Rose. The Story of a French Homestead in the Old Northwest. Columbus, Ohio, 1907.

Kennedy, Sister Mary Joseph. The Pioneer Fur Traders of Northern Indiana: Unpublished M. A. Thesis, De Paul University, Chicago, 1932.

Meyer, Alfred H. Circulation and Settlement Patterns of the Calumet Region of Northwest Indiana and Northeast Illinois (The First Stage of Occupance-The Pottawatomie and the Fur Trader-1830). Reprint from "Annals of the Association of American Geographers." Vol XLIV, September 1954, No. 3, pages 245-274.

Moore, Powell A. The Calumet Region, Indiana Last Frontier. Indiana Historical Collections, Volume XXXIX, Indiana Historical Bureau, 1959.

Pfanz, Harry W. and Jones, Russel. Bailly Homestead Historic Structures Report. Denver Service Center, National Park Service, November, 1972.

Natural History

Bretz, J. H. Geology of the Chicago Region. Urbana, Ill.: State of Illinois Geological Survey, 1955.

Kelley, R. W. and Farrand, W. R. The Glacial Lakes Around Michigan. State of Michigan Department of Conservation, Geological Survey Bulletin 4, 1967.

Smith, Robert L. Ecology and Field Biology. New York: Harper & Row, Publishers, Inc., 1966.

Natural History--Indiana Dunes

Beecher, W. J. The Indiana Dunes. Science Notes Published by The Chicago Academy of Sciences.

Cowles, Henry Chandler. "The Ecological Relations of the Vegetation of the Sand Dunes of Lake Michigan." Botanical Gazette. Feb., Mar., Apr., May 1899.

Cressey, George B. The Indiana Sand Dunes and Shore Line of the Lake Michigan Basin. Chicago, Ill.: The University of Chicago Press, 1928.

Lindsey, A. A., et al. Natural Areas in Indiana and Their Preservation. Lafayett, Indiana: Purdue University, 1969.

National Park Service. Ecological Workshop on Natural Resources of Indiana Dunes National Lakeshore. Unpublished document, April, 1971.

Peattie, Donald C. Flora of the Indiana Dunes. Chicago, Illinois: Field Museum of Natural History, 1930.

Teale, Edwin Way. Dune Boy. New York: Dodd, Mead and Company, 1943 (1958).

Watts, May Theilgaard. Reading the Landscape. New York: Macmillan Company, 1957.

Outdoor Education

Brown, Vinson. Reading the Woods. Harrisburg, Pa.: Stackpole Co., 1969.

Musselman, Virginia W. Learning About Nature Through Games. Harrisburg, Pa.: Stackpole Company, 1967

Swan, Malcolm D. Tips and Tricks in Outdoor Education. Danville, Illinois: 1970.